

## THE MINERAL INDUSTRY OF

# AUSTRIA

By Harold R. Newman

On January 1, 1995, Austria acceded to the European Union (EU). Accession was expected to spur investment, employment and growth for the country's general economy and, in particular, its mineral industry, both by providing access to the single market and by fostering policies to promote competition and dismantle protectionism. Dependent on foreign trade, Austria has had an open economy closely linked to the economies of other EU member countries, especially Germany.

The mining industry traditionally has been very popular in Austria. However, the metal mining sector continues to decline, principally due to high costs, low ore grades, environmental problems, and increased competition. This was not the case with the industrial minerals sector, which has been producing a number of important minerals. Austria has been considered a significant world producer of graphite, magnesite, and talc. Recycling activities were also increasing. (*See table 1.*)

The Austrian mineral industry, in the last several years, has turned away from coal and base-metal mining toward the industrial minerals sector and this is expected to continue. The Government has closed all its metalliferous mines, except for the iron ore operation at Erzberg, and discontinued the operation of unprofitable smelters. A small and diminishing portion of the mineral industry is still under Government control. The Mittersill tungsten mine was reopened in 1995 after being closed for 2 years for economic reasons. (*See table 2.*)

Only secondary aluminum was produced in 1995. The Ranshofen smelter, with a capacity of 50,000-metric-tons-per-year (t/yr), is the larger of two secondary smelters. The Government-owned facility was scheduled to be privatized by 1998. The operation consisted of a smelter and casthouse, a rolling mill, a press mill, and an automobile wheel plant. Scrap was obtained from private collecting organizations.

At the smaller Lend smelter, indigenous scrap is augmented with imported ingots depending on particular requirements of the finished products. The facility consisted of a 15,000 t/yr smelter, two casthouses, a crucible furnace, three oil-fired furnaces, and a closed furnace. Fuel and compressed air tanks were the main products.

The secondary copper smelter at Brixlegg relied on copper and copper alloy scrap from domestic sources as well as scrap imports from Germany and Italy. The company's modernization project, increasing the capacity of the

casthouse to 75,000 t/yr, was completed.

The Steirischen Erzberg Mine of Voest-Alpine Erzberg GmbH was the only iron ore mine operating in 1995. The open pit mine was reported to have estimated proven and probable ore reserves, grading 31% iron and about 2% manganese, amounting to about 25 million metric tons (Mt) and 150 Mt respectively. The beneficiated ore is shipped by rail to the nearby Donawitz and Linz steel mills of Voest-Alpine Stahl GmbH for the production of self-fluxing sinter, averaging 50% iron and 3% manganese.

The Donawitz steel plant was equipped with three blast furnaces with a total capacity of 2 Mt/yr, three basic oxygen converters (1.2 Mt/yr capacity) and two continuous casting machines. The Linz steel plant had five blast furnaces (2.99 Mt/yr capacity), three basic oxygen converters (3.35 Mt/yr capacity), two continuous casting machines, and several rolling mills. The Government was proceeding with plans to privatize both operations.

The Mittersill Mine of Inmet Mining Corp., on standby status since 1993, was activated in early 1995 and was reported, at yearend, to have reached its full capacity of 1,700 t/yr of tungsten trioxide contained in scheelite concentrates. The company was forecasting a mine life of between 15 to 20 years.

Most of the growth in the mineral resources area in Austria has been in the production of industrial minerals where operations have been developed by the private sector.

There are ample supplies of calcite, dolomite, and limestone to support a viable cement industry. Perlmooser Zementwerke AG (PZ), with three plants, was the largest company. PZ's largest plant, at Mannesdorf near Vienna, had a 1.4 t/yr capacity, accounting for about 65% of the annual domestic cement production.

Austria is one of the worlds largest sources of high-grade graphite. Grafitbergbau Kaiserberg AG operates open pit mines at Kaiserburg and at Treiben. Grafitbergbau's 30,000 t/yr capacity processing plant at Kaiserburg consists of drying, classification, milling, flotation, and fine grinding sections. The other company involved in graphite production is Industrie und Bergbaugesellschaft, Prysok & Co. KG, which operates the Trandorf open pit mine at Mühldorf.

Veitsch-Radex AG (VRAG) was the largest producer of magnesite in Austria. Three of its five mines were active in 1995: Breitenau, Hochfilzen, and Radentheim. With an output of about 400,000 t/yr, Breitenau is VRAG's largest

operation. Radentheim, the smallest with an output of 80,000 t/yr, produces a high iron magnesite. VRAG's dead burned magnesia capacity is very large, exceeding 400,000 t/yr. The iron and steel industry was the largest consumer of VRAG's products.

Austrian salt mines were owned by the Government and regulated by the Ministry of Finance. All salt output was from three underground mines and one brine well in central Austria. The Government was proceeding with plans to privatize the operations.

Luzenac Naintsch, the only producer of talc in Austria, operated three mines in the Styria region and produced a range of talc, chloritic talc, dolomite talc, and chlorite-mica-quartz ores. The Rabenwald open pit mine is the largest, with a capacity of about 110,000 t/yr of talc and chloritic talc. The Lassing underground mine has a capacity of 30,000 t/yr producing a dolomite-talc product with a high degree of whiteness. The Weisskirchen underground mine has a capacity of 30,000 t/yr and produces an ore containing chlorite, muscovite mica, and quartz.

In the coal mining sector, the open pit Oberdorf Mine of Graz-Koflacher Eisenbahn und Bergbaugesellschaft GmbH's lignite operations was expected to remain in production through 1996. The company oversees production from two adjacent pits. All production was used exclusively by a local powerplant. Additional coal for thermal power stations was imported from Australia and Poland.

Austria is a landlocked country and nearly all transportation is on railroads and highways. The total length of railroad consisted of 5,410 kilometer (km) of standard-gauge and 339 km of narrow-gauge tracks. About 98% of the railroad was Government-owned and more than 50% was electrified. The length of roads totaled 95,412 km, of which 34,612 km were primary highways while the rest were unpaved communal roads. The only navigable river was the Danube, with ports in Linz and Vienna.

Because of Austria's long history of minerals exploration and mining tradition, geologic conditions are well known. Future mining activities will most probably be concentrated in industrial minerals, mainly for domestic consumption.

TABLE 1  
AUSTRIA: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons, unless otherwise specified)

| Commodity                                       | 1991          | 1992      | 1993      | 1994      | 1995 e/   |          |
|---|---------------|-----------|-----------|-----------|-----------|----------|
| <b>METALS</b>                                   |               |           |           |           |           |          |
| <b>Aluminum metal:</b>                          |               |           |           |           |           |          |
| Primary   | 80,384        | 32,866    | --        | --        | --        |          |
| Secondary                                       | 33,600        | 45,400    | 43,300    | 52,500    | 51,600    |          |
| Total   | 113,984       | 78,266    | 43,300    | 52,500    | 51,600    |          |
| Cadmium, metal                                  | 19            | --        | --        | --        | --        |          |
| <b>Copper:</b>                                  |               |           |           |           |           |          |
| Smelter, secondary                              | 44,758        | 48,975    | 46,856    | 49,562    | 53,400    |          |
| <b>Refined:</b>                                 |               |           |           |           |           |          |
| Primary   | 8,079         | 5,705     | 5,871     | 2,904 r/  | 1,500     |          |
| Secondary                                       | 44,758        | 48,975    | 46,856    | 49,562 r/ | 50,000    |          |
| Total   | 52,837        | 54,680    | 52,727    | 52,466 r/ | 51,500    |          |
| Germanium, Ge content of concentrate            | 5,000 e/      | --        | --        | --        | --        |          |
| Gold, metal                                     | 60            | 158       | 315       | 382       | 100       |          |
| <b>Iron and steel:</b>                          |               |           |           |           |           |          |
| <b>Iron ore and concentrate:</b>                |               |           |           |           |           |          |
| Gross weight                                    | thousand tons | 2,130     | 1,627     | 1,427     | 1,653     | 2,116 2/ |
| Fe content                                      | do.           | 481       | 510       | 448       | 390       | 510      |
| <b>Metal:</b>                                   |               |           |           |           |           |          |
| Pig iron  | do.           | 3,442     | 3,074     | 3,070     | 3,362     | 3,878 2/ |
| Ferroalloys, electric-furnace e/                | do.           | 12        | 12        | 12        | 431 2/    | 454 2/   |
| Crude steel                                     | do.           | 4,186     | 3,953     | 4,149     | 4,399     | 4,400    |
| Semimanufactures                                | do.           | 3,500 e/  | 3,360     | 3,450     | 3,500     | 3,200    |
| <b>Lead:</b>                                    |               |           |           |           |           |          |
| Mine output, Pb content of concentrate          |               | 1,915     | 1,715     | 2,047     | --        | --       |
| <b>Metal:</b>                                   |               |           |           |           |           |          |
| <b>Smelter:</b>                                 |               |           |           |           |           |          |
| Primary   |               | 5,500 e/  | 3,800 e/  | 2,000     | --        | --       |
| Secondary                                       |               | 14,600 e/ | 17,800 e/ | 18,800    | 17,200    | 18,000   |
| Total   |               | 20,100    | 21,600    | 20,800    | 17,200    | 18,000   |
| <b>Refined:</b>                                 |               |           |           |           |           |          |
| Primary   |               | 6,350     | 5,730     | 4,780     | --        | --       |
| Secondary                                       |               | 16,300    | 18,200    | 17,900    | 17,165 r/ | 18,000   |
| Total   |               | 22,650    | 23,930    | 22,680    | 17,165 r/ | 18,000   |
| Manganese, Mn content of domestic iron ore      |               | 39,925    | 30,752    | 26,890    | 31,288 r/ | 30,000   |
| Silver, metal                                   |               | 29        | 22        | -- r/     | 24        | --       |
| Tungsten, mine output, W content of concentrate |               | 1,380     | 1,730     | 120       | --        | 188      |
| <b>Zinc:</b>                                    |               |           |           |           |           |          |
| Mine output, Zn content of concentrate          |               | 16,354    | 15,787    | 20,014 e/ | --        | --       |
| Metal, primary, refined                         |               | 15,900    | 5,537     | 6,838     | --        | --       |
| <b>INDUSTRIAL MINERALS</b>                      |               |           |           |           |           |          |
| Cement, hydraulic                               | thousand tons | 5,020     | 5,031     | 4,941     | 5,000 e/  | 5,000    |
| <b>Clays:</b>                                   |               |           |           |           |           |          |
| Illite  | do.           | 217       | 276       | 300       | 267       | 250      |
| <b>Kaolin:</b>                                  |               |           |           |           |           |          |
| Crude   | do.           | 352       | 344       | 342       | 469       | 437 2/   |
| Marketable                                      | do.           | 72        | 65        | 64        | 87 e/     | 75       |
| Other   | do.           | 3,460     | 3,450     | 2,990     | 2,981     | 2,900    |
| Feldspar, crude                                 |               | 10,429    | 11,059    | 8,492     | 4,883     | 5,000    |
| Graphite, crude                                 |               | 19,800    | 19,796    | 4,146     | 12,324    | 12,000   |
| Gypsum and anhydrite, crude                     | thousand tons | 655       | 792       | 876       | 1,070     | 1,000    |
| Lime  | do.           | 1,600 e/  | 1,720     | 1,810     | 1,850     | 1,800    |
| <b>Magnesite:</b>                               |               |           |           |           |           |          |
| Crude   | thousand tons | 961       | 995       | 649       | 681       | 784 2/   |
| Sintered or dead-burned                         | do.           | 337       | 223       | 323       | 240       | 350      |
| Caustic calcined                                | do.           | 57        | 54        | 50        | 76        | 50       |
| Nitrogen, N content of ammonia e/               |               | 410       | 410       | 400       | 400       | 400      |
| Pigments, mineral, micaceous iron oxide         |               | 10,200    | 9,480     | 8,400     | 8,000 e/  | 8,000    |
| Pumice (trass)                                  |               | 8,200     | 7,490     | 9,100     | 5,670     | 6,000    |
| <b>Salt:</b>                                    |               |           |           |           |           |          |
| Rock  | thousand tons | 1         | 1         | 1         | 1         | 1        |
| In brine  | do.           | 698       | 662       | 695       | 701 r/    | 700      |
| <b>Sand and gravel:</b>                         |               |           |           |           |           |          |
| Quartz sand                                     | do.           | 2,090     | 5,880     | 4,300     | 6,457     | 7,503 2/ |
| Other sand and gravel                           | do.           | 17,000    | 17,400    | 16,900    | 58,000    | 50,000   |
| Total   | do.           | 19,090    | 23,280    | 21,200    | 64,457    | 57,503   |

See footnotes at end of table.

TABLE 1--Continued  
AUSTRIA: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons, unless otherwise specified)

| Commodity                                  | 1991      | 1992       | 1993        | 1994       | 1995 e/  |
|--|-----------|------------|-------------|------------|----------|
| <b>INDUSTRIAL MINERALS--Continued</b>      |           |            |             |            |          |
| Sodium compounds, n.e.s.: e/               |           |            |             |            |          |
| Soda ash, manufactured do.                 | 150       | 150        | 150         | 150        | 200      |
| Sulfate, manufactured do.                  | 120       | 120        | 120         | 120        | 100      |
| Stone: 3/                                  |           |            |             |            |          |
| Dolomite do.                               | 5,090     | 5,870      | 7,770       | 8,159      | 8,790 2/ |
| Quartz and quartzite do.                   | 464       | 511        | 429         | 416        | 395      |
| Other:                                     |           |            |             |            |          |
| Limestone and marble do.                   | 15,400    | 19,300     | 19,600      | 19,993     | 19,080   |
| Basalt do.                                 | 3,670     | 4,100      | 3,360       | 4,092      | 4,202 2/ |
| Marl do.                                   | 2,780     | 2,640      | 2,840       | 2,306      | 1,931 2/ |
| Crushed stone do.                          | 10,700    | 10,600     | 11,500      | 27,000     | 15,000   |
| Total do.                                  | 38,104    | 43,021     | 45,499      | 61,966     | 49,398   |
| Sulfur, byproduct:                         |           |            |             |            |          |
| Of metallurgy e/                           | 10,700    | 8,200      | 9,296 r/ 2/ | 9,500      | 8,000    |
| Of petroleum and natural gas               | 7,140     | 8,683      | 7,656       | 9,266      | 9,000    |
| Total                                      | 17,840    | 16,883     | 16,952      | 18,766     | 17,000   |
| Talc and soapstone, crude                  | 161,425   | 145,664 r/ | 136,640     | 154,647 r/ | 131,600  |
| <b>MINERAL FUELS AND RELATED MATERIALS</b> |           |            |             |            |          |
| Coal, brown and lignite thousand tons      | 2,080     | 1,753 r/   | 1,691       | 1,372      | 1,251 2/ |
| Coke do.                                   | 1,540     | 1,490 r/   | 1,400       | 1,400 e/   | 1,400    |
| Gas, natural:                              |           |            |             |            |          |
| Gross million cubic meters                 | 1,330     | 1,440      | 1,488       | 1,355 r/   | 1,482 2/ |
| Marketed e/ do.                            | 1,100     | 1,100      | 1,100       | 1,000      | 1,000    |
| Oil shale                                  | 290       | 430        | 195         | 1,146      | 1,078 2/ |
| Petroleum:                                 |           |            |             |            |          |
| Crude thousand 42-gallon barrels           | 8,930     | 8,230      | 8,060       | 7,671      | 7,670    |
| Refinery products:                         |           |            |             |            |          |
| Liquefied petroleum gas do.                | 7,840     | 7,380      | 6,760       | 4,292      | 6,960    |
| Gasoline do.                               | 20,500    | 19,500 e/  | 19,000 e/   | 21,598     | 17,680   |
| Kerosene and jet fuel do.                  | 3,030     | 3,240      | 3,140       | 2,929      | 3,309    |
| Distillate fuel oil do.                    | 11,900    | 12,900     | 12,800      | 9,064      | 8,736    |
| Lubricants do.                             | 8,280     | 6,910      | 8,670       | 280 e/     | --       |
| Residual fuel oil do.                      | 11,800    | 11,700     | 11,000      | 11,000 e/  | 11,000   |
| Bitumen do.                                | 1,760     | 1,120      | 1,660       | 1,500 e/   | 1,500    |
| Unspecified do.                            | 714       | 787        | 739         | 628        | 630      |
| Refinery fuel and losses do.               | 2,000     | 2,470      | 2,240       | 2,102      | 2,310    |
| Total e/ do.                               | 67,824 2/ | 66,007     | 66,009      | 53,393     | 52,125   |

e/ Estimated. r/ Revised.

1/ Table includes data available through May 1996.

2/ Reported figure.

3/ Excluding stone used by the cement and iron and steel industries.

TABLE 2  
AUSTRIA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1995

(Thousand metric tons unless otherwise specified)

| Commodity   | Major operating companies<br>and major equity owners  | Location of<br>main facilities                           | Annual<br>capacity |
|-------------|---|--|--------------------|
| Aluminum    | Salzburger Aluminum GmbH  | Smelter at Lend  | 15                 |
| Do.         | Austria Metall AG (Government 100%)   | Smelter at Ranshofen                                     | 50                 |
| Cement      | Perlmooser Zementwerke AG   | Plants at Kirchblich, Mannesdorf, Retsnei, and Rodaun    | 3,000              |
| Do.         | Gebr Leube Portlandzementwerke  | Plant at Gartenau  | 700                |
| Do.         | Zemenwerke Eiberg   | Plant at Eiberg  | 600                |
| Do.         | Wietersdorfer Zemenwerke  | Plant at Wietersdorf                                     | 600                |
| Coal        | Graz-Koflacher Eisenbahn und Bergbaugesellschaft mbH<br>(Government 100%)                                     | Oberdorf Mine  | 1300               |
| Do.         | Salzach-Kohlenbergbau Gesellschaft m.b.H.<br>(Government 100%)  | Trimmelkam Mine  | 100                |
| Copper      | Austria Metall AG (Metal Mining Corp. of Canada 41%,<br>Mount Isa Mines of Australia 41%, and Government 18%) | Plant at Brixlegg  | 75                 |
| Graphite    | Industrie und Bergbaugesellschaft Pryssok & Co KG   | Trandorf Mine at Mühldorf                                | 15                 |
| Do.         | Grafitbergbau Kaisersberg Franz Mayr-Melnhof & Co   | Kaisersberg Mine   | 3                  |
| Do.         | Grafitbergbau Trieben GmbH  | Trieben Mine   | 3                  |
| Gypsum      | Erste Salzburger Gipswerk-Gesellschaft Christian Moldan KG  | Abtenau and Moosegg Mines                                | 300                |
| Do.         | Rigips Austria GmbH   | Grundlsee, Puchberg, Unterkainisch, and Weisenbach Mines | 250                |
| Do.         | Knauf Gesellschaft mbH  | Hinterstein Mine   | 160                |
| Iron ore    | Voest-Alpine Erzberg GmbH (Government 100%)   | Erzberg Mine at Eisenerz                                 | 2,000              |
| Lead        | Bleiberg Bergwerks-Union AG (Metall Gesellschaft 74%)   | Smelter at Brixlegg                                      | 55                 |
| Magnesite   | Veitsc - Radex AG   | Mines at Breitenau, Hochfilzen and Weissenstein          | 600                |
| Do.         | Radex Austria AG (Osterreichische Magnesit AG 100%)   | Millstatteralpe Mine                                     | 250                |
| Natural gas | million cubic meters Osterreichische Mineralolverwaltung AG (Government 100%)                                 | Fields in Vienna Basin                                   | 1,500              |
| Steel       | Voest-Alpine Stahl GmbH (Government 100%)   | Plants at Donawitz and Linz                              | 4,500              |
| Talc        | Naintsch Mineralwerke   | Mines at Lassing, Rabenwald, and Weisskirchen            | 160                |
| Tungsten    | Wolfram Bergbau und Hüttengesellschaft mbH.   | Plants at Oberfeistitz and Weisskirchen                  |                    |
|             |   | Mittersill Mine, Salzburg; conversion plant, Bergla      | 350                |